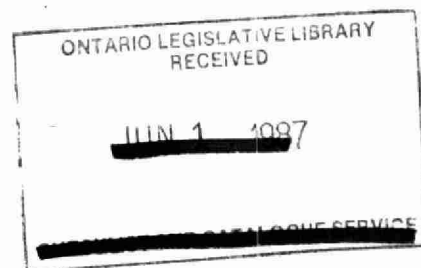


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EVR 125  
A369

AIR QUALITY ASSESSMENT  
THUNDER BAY TERMINALS LIMITED  
THUNDER BAY  
1982



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TECHNICAL SUPPORT SECTION  
NORTHWESTERN REGION  
ONTARIO MINISTRY OF THE ENVIRONMENT  
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## INTRODUCTION

Since 1975, the Ontario Ministry of the Environment has undertaken pre- and post-operational air quality studies in the vicinity of a coal terminal operated by Thunder Bay Terminals Limited in Thunder Bay. All data collected since June, 1978, when coal shipments began, showed that dust levels did not increase around the project site. In 1982, about 3 million tonnes of coal (including lignite) and 1 million tonnes of potash were handled at this facility.

Because the terminal had demonstrated full compliance with Ontario's air quality regulations at off-property sites, it was felt that monitoring could be effectively continued at a reduced level. Therefore, in 1981, the number of monitoring stations was decreased to six sites for dustfall measurement and three for suspended particulate matter. Wind measurements continued unchanged.

## AIR QUALITY DATA

### DUSTFALL

Dustfall, which comprises particulate matter that settles out from the air by gravity, was measured at the sites shown in Figure 1. Four of the six locations (sites 1, 3, 6 and 7) are in a network operated by Thunder Bay Terminals Limited. The other two (sites 9 and 10) are Ministry stations.

Dustfall for 1982 is summarized in Table 1. Only two of the 36 off-property values exceeded the maximum acceptable limit of  $7 \text{ g/m}^2/30 \text{ days}$ . One of these values, at site 9, was attributed mainly to road dust and biological material. The other, at site 10, was only marginally above the objective. The annual objective ( $4.6 \text{ g/m}^2/30 \text{ days}$ ) was not exceeded at any off-property site. Average dustfall levels in 1982 were similar to those recorded in preceding years (Table 2).

## TOTAL SUSPENDED PARTICULATE MATTER (TSP)

Suspended particulate matter was measured for a 24-hour period every sixth day with a standard high volume sampler. Table 3 summarizes the 1982 results for the Ministry location (site 10) and the two sites (1 and 3) maintained by Thunder Bay Terminals. The 24-hour objective ( $120 \mu\text{g}/\text{m}^3$ ) was slightly exceeded twice at site 3 (on company property), and only once at one of the two off-property sites. The objective for annual average TSP ( $60 \mu\text{g}/\text{m}^3$ ) was met at all sites in 1982, as it was in preceding years. Average TSP concentrations in 1982 (Table 4) were lower than the average during the 1976-1981 period.

## CONCLUSIONS

Measurements of dustfall and suspended particulate matter both on and off property at Thunder Bay Terminals continued to demonstrate satisfactory air quality in 1982. Although monitoring will continue at its present level during 1983, the Ministry may consider further reductions in the monitoring program for 1984.

## ACKNOWLEDGEMENT

The Ministry wishes to thank Thunder Bay Terminals Limited for providing data on wind measurements, dustfall and suspended particulate matter from its monitoring network.

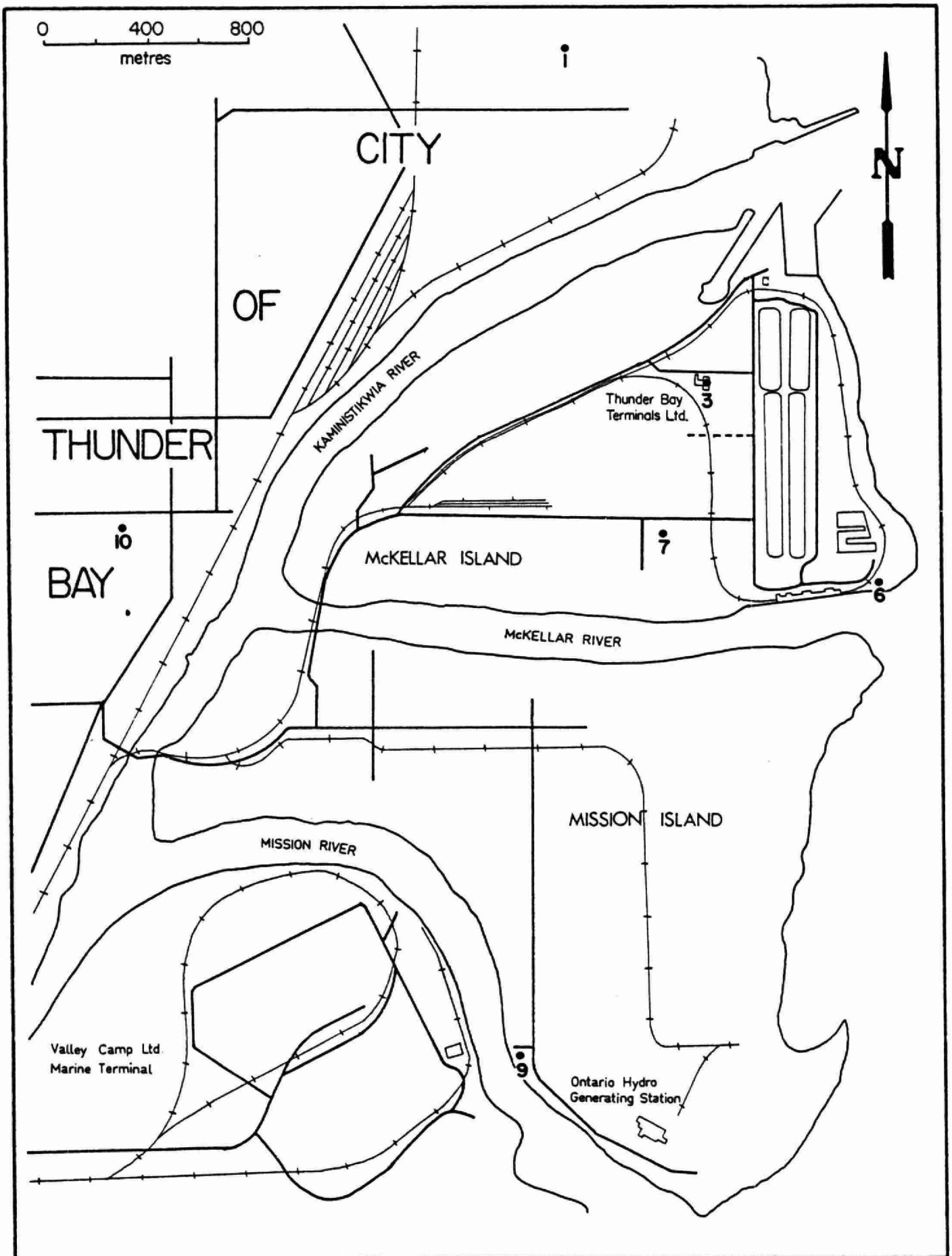


Figure 1. Air quality monitoring sites, 1982.

TABLE 1. Dustfall (g/m<sup>2</sup>/30 days) in the vicinity of Thunder Bay Terminals Limited, 1982.

Site	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1	Sewage Treatment Plant	4.3	0.2	1.4	3.8	2.7	3.2	4.0	4.0	3.0	2.4	2.2	1.8	2.8
3	Thunder Bay Terminals	2.5	1.8	3.7	<u>9.8</u>	5.4	5.6	5.8	6.6	5.1	3.1	3.6	3.3	<u>4.7</u>
6	Thunder Bay Terminals	-	-	0.9	-	<u>8.0</u>	6.1	<u>14.2</u>	<u>30.3</u>	4.4	<u>9.6</u>	4.0	1.7	<u>8.8</u>
7	Thunder Bay Terminals	0.8	2.8	4.3	3.3	<u>3.0</u>	5.0	<u>3.0</u>	<u>6.8</u>	2.6	<u>2.9</u>	2.5	1.8	<u>3.2</u>
9	Kam Boating Club	0.1	1.1	2.0	3.5	<u>14.2</u>	4.1	5.8	2.9	2.6	1.7	1.8	1.0	3.4
10	McKellar Hospital	1.3	1.6	4.0	<u>8.4</u>	<u>4.4</u>	3.2	5.7	4.5	3.6	2.6	2.2	2.5	3.8

<sup>a</sup>Values exceeding maximum acceptable levels of 7.0 (monthly) or 4.6 (annual average) are underlined.

TABLE 2. Average annual dustfall (g/m<sup>2</sup>/30 days) in the vicinity of Thunder Bay Terminals Limited and Ontario Hydro, 1976-1982.

Site	Location	1976	1977	1978	1979	1980	1981	1982
1	Sewage Treatment Plant	3.2	4.4	3.2	2.8	2.5	2.1	2.8
2	Shell Oil Terminal <sup>b</sup>	4.2	<u>8.4</u> <sup>a</sup>	<u>5.1</u>	3.7	4.2	2.9	-
3	Thunder Bay Terminals	4.2	4.2	2.7	2.7	<u>5.2</u>	3.6	<u>4.7</u>
4	Ontario Hydro (SE) <sup>b</sup>	4.2	<u>11.5</u>	<u>7.4</u>	<u>5.9</u>	<u>6.8</u>	<u>8.8</u>	-
5	Thunder Bay Terminals <sup>b</sup>	-	-	-	-	3.9	4.0	-
6	Thunder Bay Terminals	-	-	-	-	<u>8.5</u>	<u>6.9</u>	<u>8.8</u>
7	Thunder Bay Terminals	-	-	-	-	<u>7.9</u>	4.3	3.2
9	Kam Boating Club	<u>5.6</u>	4.6	4.3	4.2	2.5	2.1	3.4
10	McKellar Hospital	3.5	<u>5.0</u>	3.8	3.8	4.0	3.7	3.8

<sup>a</sup>Values exceeding maximum acceptable levels of 4.6 are underlined.

<sup>b</sup>Dustfall sites terminated December 31, 1981.

TABLE 3. Concentrations of total suspended particulate matter ( $\mu\text{g}/\text{m}^3$ ) in the vicinity of Thunder Bay Terminals Limited, 1982.

Sampling sites					Sampling sites				
Date		1	3	10	Date		1	3	10
Jan	5	18	17	33	Jul	4	18	42	31
	11	10	8	16		10	13	38	33
	16	23	21	45		16	34	16	46
	23	22	21	20		22	42	63	45
	29	19	31	35		28	52	116	47
Feb	4	25	30	73	Aug	3	15	<u>147</u>	21
	10	20	27	48		9	17	<u>19</u>	19
	16	15	15	37		15	26	32	33
	22	24	16	29		21	33	43	29
	28	31	-	54		27	27	29	24
Mar	6	18	25	43	Sep	2	20	20	22
	12	62	26	31		8	59	44	61
	18	11	8	34		14	26	43	36
	24	23	28	-		20	15	17	-
	30	51	17	41		26	41	39	51
Apr	5	44	21	38	Oct	2	12	11	20
	11	15	29	25		8	25	33	36
	17	11	21	25		14	21	22	26
	23	46	55	81		20	17	18	18
	29	56	92	<u>143</u> <sup>a</sup>		26	68	67	83
May	5	61	66	94	Nov	1	54	59	63
	11	35	35	35		7	15	62	65
	17	26	30	25		13	32	19	29
	23	60	71	59		19	104	53	52
	29	21	39	87		25	40	23	50
Jun	4	34	63	90	Dec	1	33	21	33
	10	33	39	34		7	50	58	51
	16	29	81	51		13	51	<u>142</u>	115
	22	27	39	35		19	15	<u>12</u>	10
	28	45	-	47		25	52	10	25
						31	8	31	-
Annual geometric means:							28	32	39

<sup>a</sup>Values exceeding maximum acceptable level of  $120 \mu\text{g}/\text{m}^3$  (24-hour average) are underlined.



TABLE 4. Annual geometric means of total suspended particulate matter ( $\mu\text{g}/\text{m}^3$ ) in the vicinity of Thunder Bay Terminals Limited, 1976-1982.

Site	Location	1976	1977	1978	1979	1980	1981	1982
1	Sewage Treatment Plant	41	31	27	30	28	31	28
2	Shell Oil Terminal <sup>b</sup>	<u>61</u> <sup>a</sup>	60	48	41	36	43	
3	Thunder Bay Terminals	47	33	34	33	33	39	32
10	McKellar Hospital	49	36	44	51	44	52	39

<sup>a</sup>Values exceeding maximum acceptable levels of  $60 \mu\text{g}/\text{m}^3$  (annual geometric mean) are underlined.

<sup>b</sup>Terminated December 31, 1981.

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